BattPAT

Battery Powered
Portable Appliance Tester

User Manual
Issue 1.2a

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CARING FOR YOUR BATTPAT **(inside back cover)**

SAFETY

Please read this manual carefully to make yourself familiar with the capabilities and functions of the BattPAT before attempting to use it.

1. This manual contains all the information necessary to carry out in-service testing of all electrical appliances. If after reading this manual you are still not confident about carrying out the tests then please consider either:
   Attending one of our "Demystifying Portable Appliance Testing" courses held around the UK or studying our Distance Learning Package on Portable Appliance Testing. See our website www.firststopsafety.co.uk for details.

2. The unit is designed to be powered from a rechargeable 9V NiMH battery. This is built into the unit and is not designed to be a user replaceable item.

3. The IEC socket provided is for the testing of IEC leads. Take great care not to plug an IEC lead into the mains and then into this socket. However, if this should happen accidentally the unit is protected internally.

4. A battery charger rated at 12V and 300mA is provided with the BattPAT. There is no mains power-on switch. To isolate the unit from the mains, either switch off at the mains socket or disconnect the battery charger.

5. There are no user serviceable parts in this unit. Under no circumstances should the user attempt to open the unit. If opened, the warranty will be invalidated.

6. The BattPAT is guaranteed for one year from the date of purchase. Please keep your invoice as proof of purchase. Should the unit require a service, repair or calibration, please return it to the address at the back of this user manual.

   When returning the unit, please contact the Sales Department to receive a Returns Number. The owner will be advised of any costs prior to work commencing.

GETTING STARTED

Before using the BattPAT please check that the following items have been included in the shipment:

- BattPAT unit
- Battery charger
- Earth test lead
- Short IEC lead
- User manual
- Equipment Register form
- Test Record form
- 100 Tested, 5 Failed and 50 Fuse labels.

Check for any damage in transit. If there is any sign of damage, please report it to your supplier and do not attempt to repair the unit.

INTRODUCTION

The Electricity at Work Regulations 1989 (EAW) places certain requirements on employers, designed to control risks that can arise from the use of electricity. In practice, this means that all electrical appliances at work need to be inspected and tested.

The BattPAT is a compact battery powered Portable Appliance Tester, and can be used to test PCs, monitors, kettles, desk lights, drills, hairdryers etc. If an appliance has a plug it can be tested on BattPAT.

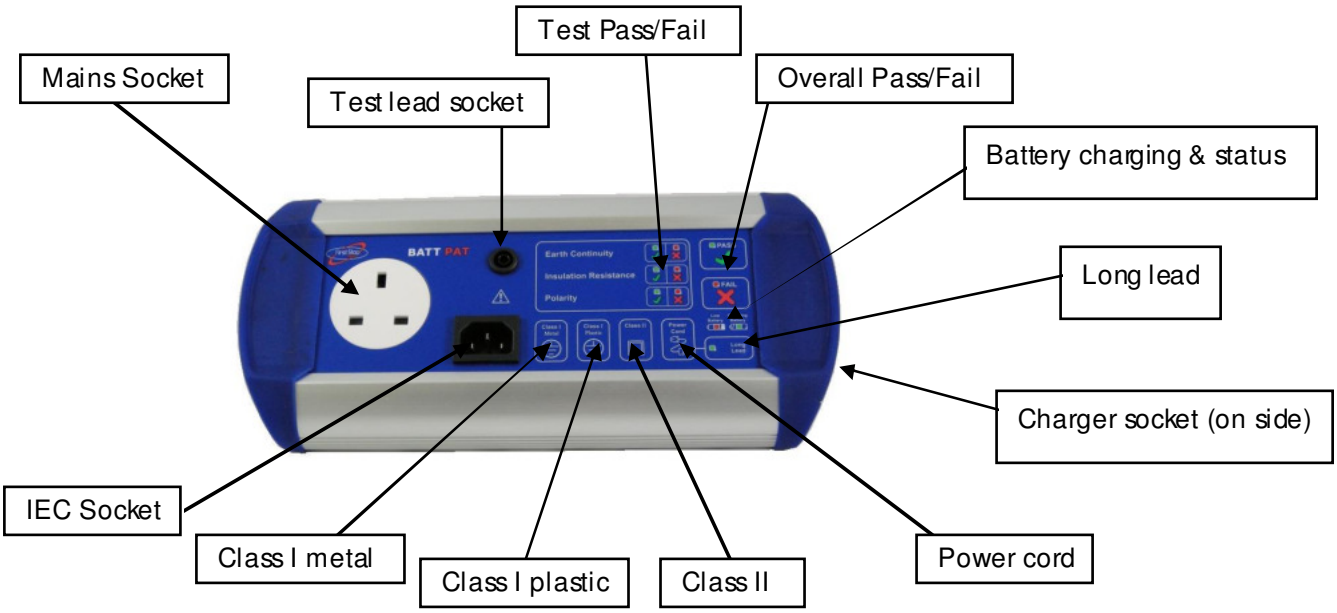
The clear controls and displays make this instrument very easy to use. The instructions, labels and sample records supplied make it very easy for anyone to undertake safety testing on all electrical appliances.

The user has only to decide whether the equipment to be tested is built to a Class I or Class II construction. The supplied test clip is connected and the appropriate button pressed.

Before any PAT Testing is carried out, it is very important to inspect the appliance. Many faults, e.g. a wrong value fuse or a wrongly wired plug, can only be found by careful inspection. This user manual sets out how this can be carried out.

Also included are master forms that can be used for managing PAT Testing in the workplace. These can be copied as many times as required.

FEATURES



CLASS I METAL TEST

When this button is pressed, the unit will test Earth Continuity and Insulation Resistance showing the results for each test and an overall PASS or FAIL.

CLASS I PLASTIC TEST

When this button is pressed, the unit will test Insulation Resistance showing the result for the test and an overall PASS or FAIL.

CLASS II TEST

When this button is pressed, the unit will test Insulation Resistance showing the result for the test and an overall PASS or FAIL.

POWER CORD

When this button is pressed, the unit will carry out an Earth Continuity, Insulation Resistance and a Polarity test showing the results for each test and an overall PASS or FAIL.

LONG LEAD

This is used when appliances and power cords exceeding 10m in length are being tested. With this function, the BattPAT can test appliances and power cords up to 40m in length.

BATTERY CHARGING

When the battery capacity is low, a battery Low led will start to flash warning the user to recharge at the next available opportunity. If the battery charge is too low, the unit will not operate.

When the charger is first plugged in a fast charge is applied for one hour. During this period, the charge led flashes. After this the battery is charged at a low "trickle rate" to keep it topped up. The charge led is on steady during this time.

It is important not to leave the battery on charge for longer than 12 hours. The BattPAT can be powered using the charger if the battery is flat.

SHORT IEC LEAD

This allows mains extension leads to be tested easily.

SAMPLE FORMS

An "Equipment Register" and a "Equipment Test Record" form is included. These can be copied and used as often as required. The user manual refers to this under the relevant sections.

LABELS

100 'tested' labels, 5 'failed' labels and 50 fuse labels are supplied with each unit. Additional labels are available to purchase separately.

SELF TEST

The BattPAT has a built in self test feature. If the test voltages or currents are outside the expected range, then it will not carry on with the testing. The overall PASS and FAIL leds will flash to indicate a problem. If this were to happen, then contact your supplier.

PLANNING THE TESTS

Before commencing testing, it is advisable to take a few minutes to plan. First of all work out whether the equipment is Class I or II. Then the type of equipment and the environment it is going to be used in. This will help to determine how often the inspection and testing has to be carried out. The Equipment Register then needs to be prepared. Once this is completed, one is ready to commence Inspection and Testing.

Class of construction

All equipment that uses mains electricity are either Class I or Class II. Knowing the Class of the equipment is important when planning the testing.

If the ⧈ symbol is present on the rating plate the equipment is Class II. If the ⧈ symbol is missing, assume that the equipment is Class I. Mains extension leads and IEC leads are treated as Class I appliances.

Type of equipment

For the purpose of planning, electrical equipment is categorized into 5 types as shown below. In general, the easier it is to move an appliance, the higher the chances of damage to it and the more frequently it has to be tested.

Stationary equipment: Refrigerators and washing machines are examples.

Information Technology equipment: This includes computers, VDUs, data terminals, telephones, printers, fax machines and photocopiers.

Movable (transportable) equipment: Items that are moved occasionally, like fans and fires would fit in this category.

Portable appliance: These are appliances such as vacuum cleaners, toasters and kettles which can easily be moved whilst connected to the mains.

Handheld appliance: This is equipment intended to be held in the hand during normal use like a hair dryer or drill.

Environment

The location of equipment will have a bearing on the frequency of testing. For example an item that is used in a low-risk environment such as an office will have a much lower risk of damage than an item used on a construction site. Please see below for various examples.

Low risk: Offices, shops, hotels and nursing homes
Medium risk: Schools
High risk: Factories, commercial kitchens and equipment used by the public.
Very high risk: Construction sites

Frequency of visual inspection and testing

It is not essential to carry out inspecting and testing every year. Table 1 below gives some intervals that are recommended in low risk environments, such as offices, shops, hotels, and nursing homes. (Timescales for other environments can be found in Appendix I)

	Class I		Class II	
Type	**Inspection**	**Insp. & test**	**Inspection**	**Insp. & test**
Stationary	24 months	48 months	24 months	none
IT	24 months	48 months	24 months	none
Movable	12 months	24 months	24 months	none
Portable	12 months	24 months	24 months	none
Hand-held	6 months	12 months	6 months	none

Table 1: Frequency of inspection and testing in low risk environments

Equipment Register

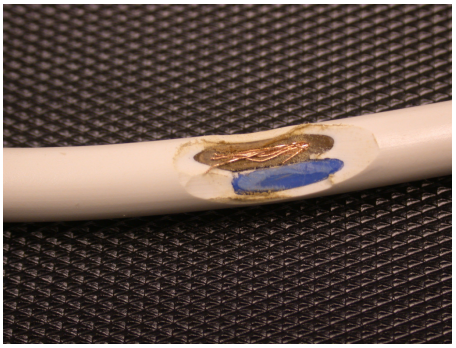
This form is used to list all the electrical equipment in the business. Information, such as Class I or II, type of equipment and frequency of test is recorded. A blank form is supplied, and this can be photocopied and used if additional sheets are required. As new equipment is purchased, this needs to be added to the register.

FORMAL VISUAL INSPECTION

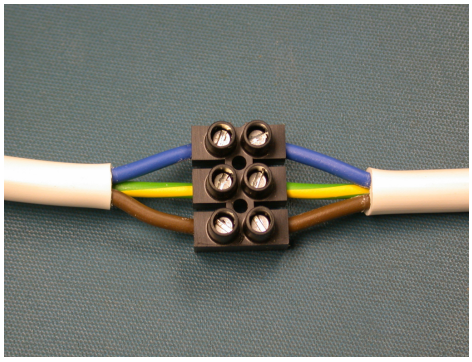
Once the above preparation work has been carried out, the visual inspection is quite straightforward. It is important to prepare a Test Record for each piece of equipment. A sample form is provided that can be photocopied and used as required. This form will be used to record the history of visual inspection and testing.

Formal Visual Inspection is a very important part of making sure that appliances are safe to use. In fact, the majority of faults can only be found by a good visual inspection of the appliance. The following is a list of faults to look for:

Cable



Damage to power cable sheath.



Any non-standard joints.

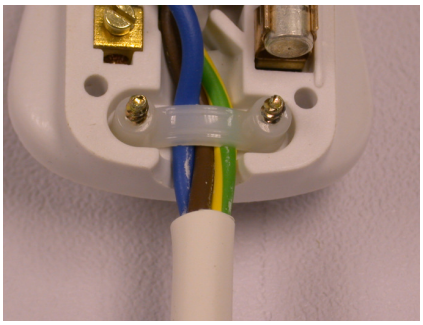
Appliance

Signs that the equipment has been subject to conditions for which it is not suitable, e.g. wet or excessively rusty.

Cable not being gripped.

Damage to external casing.

Plug external

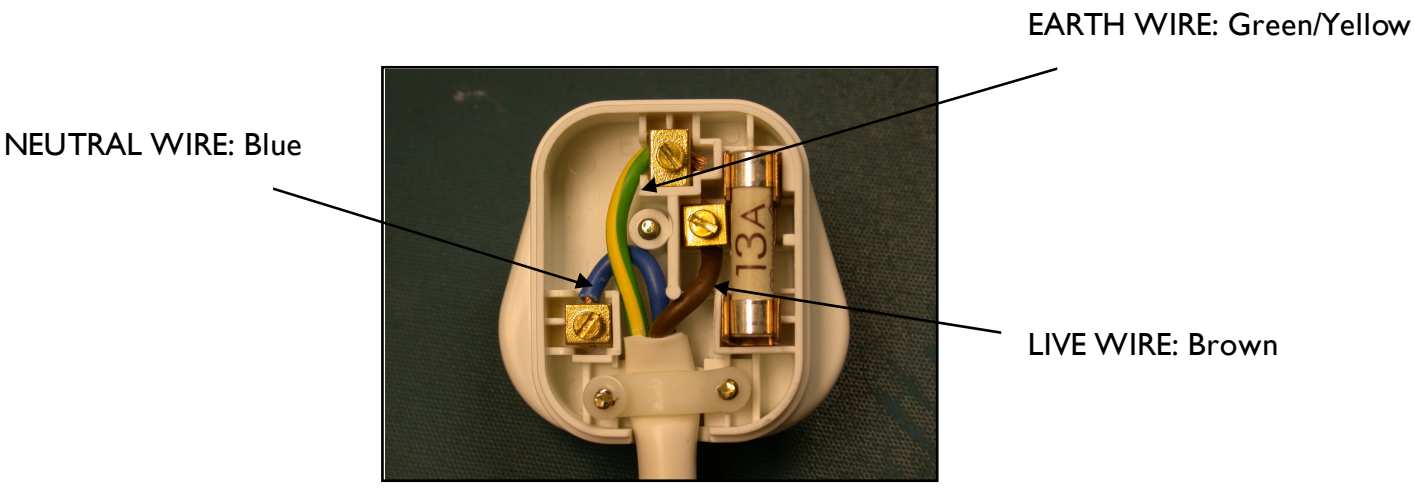


Cable not being gripped.

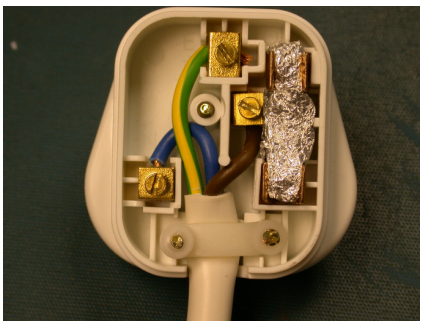
Damage to mains plug.

Plug internal

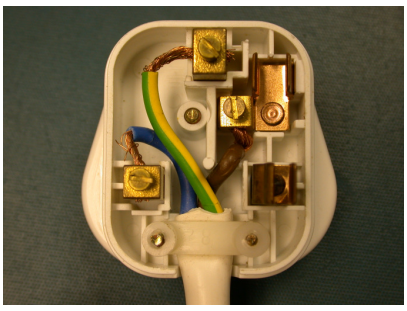
In addition to the above, the plug cover (if it is not molded) needs to be taken off and check that the cable terminations are correct.



Examples of faults:



Fuse not being used.



Bare wires visible.

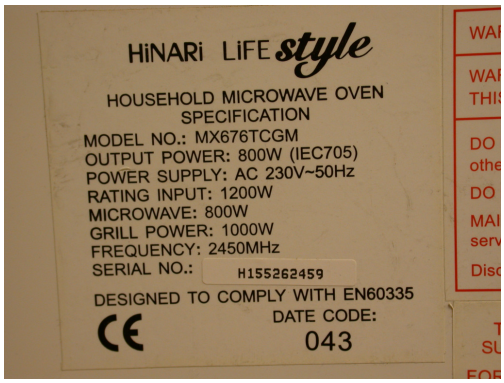
Fuse rating

Check fuse rating. If possible, refer to manufacturer's user guide. Otherwise follow guidelines below:

3A or 5A fuse fitted: NO action.
13A fuse fitted: Then check power rating.
If power is less than 700 W then fit 3 Amp Fuse.
If power is more than 700 W then NO action.

Examples:

40W rating, requires 3A fuse.



1200W rating, requires 13A fuse.

If the equipment fails on any of the above points, then it must be taken out of service, a "DO NOT USE" label applied and not used again until it has been properly repaired and tested.

Under no circumstances must one proceed with the testing stage, if a failure is found during the Formal Visual Inspection stage.

OPERATION

Testing Class I equipment

The equipment to be tested is plugged into the mains socket on the BattPAT. The test clip is connected to any exposed metal on the equipment. For example on a kettle this will be the element. On a PC it will be the metal case.

Press the Class I (metal) button. The test will now run and the display will show the result for the Earth Continuity and Insulation Resistance tests. As well as an overall Pass or Fail.

Note 1: When the tests are performed, it is important to put the on/off button/ switch to the "On" position and flex the power lead to make sure that any loose connections are stressed and are picked up by the test. The Earth Continuity test is repeated automatically to look for this.

Note 2: On some appliances, paint, rust or scale will prevent a good earth. It is important to persevere and try and get a good earth connection when carrying out this test,

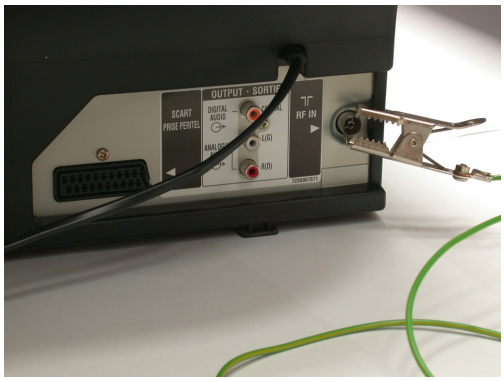
Some Class I appliances (eg electric fans, vacuum cleaners) may not have any exposed metal to connect the test clip to. If this is the case, then use the Class I plastic button The Insulation Resistance will be tested and a Pass or Fail will be displayed.

Once the testing is complete, record the results on the Test Record.

Class I Earth Connection

Finding a good earth on Class I appliances comes with experience. To help you identify where to connect the test lead, we have provided a few examples below.

PC; Case or connector



Television; Aerial

Hot melt gun; nozzle

Iron; Behind plate

Testing Class II equipment

The equipment to be tested is plugged into the mains socket on BattPAT. The test clip is connected to any exposed metal on the equipment, if present.

Press the Class II button. The test will now run and the display will show the result for the Insulation Resistance as well as an overall Pass or Fail.

Note 1: When testing Class II appliances, it is important to put the on/off button/ switch to the "On" position and connect the test lead to any exposed metal. If there is a fault on the appliance, and this connection is not made there is a chance that this fault will be missed.

Note 2: On Class II appliances, such as hair driers where there is no exposed metal, the test lead can be left unconnected.

Once the testing is complete, record the results on the Test Record.

Testing IEC leads

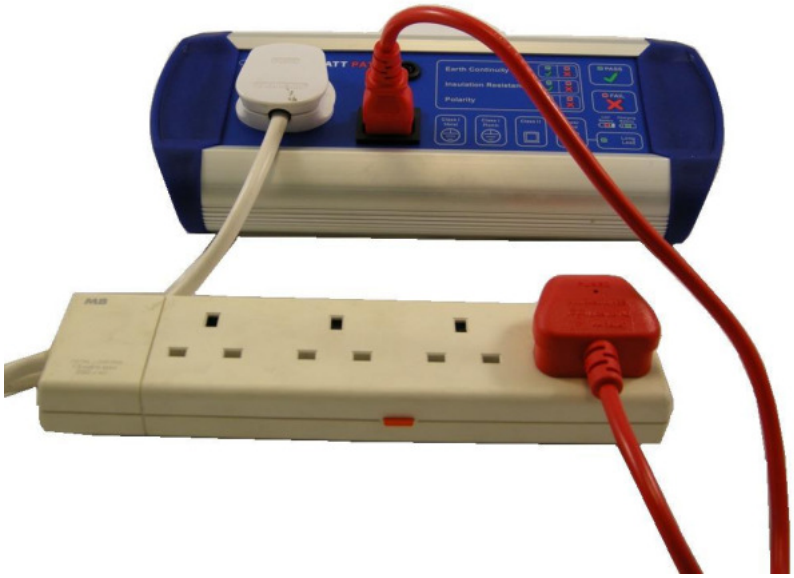
When testing IT equipment with detachable IEC leads, it is important to test these as individual items.

Plug both ends of the IEC lead into the BattPAT. One end into the mains socket and the other end into the IEC socket. Press the Power cord button. The test will be run and the result for Earth Continuity, Insulation Resistance and Polarity will be displayed as well an overall Pass or Fail.

Once the testing is complete, it is important to label the leads.

Testing mains extension leads

This short IEC lead allows the testing of mains extension leads. Plug the extension lead into the BattPAT. Plug the adaptor into one of the sockets of the extension lead and also into the IEC testing socket on the BattPAT. Press the Power cord button to test Earth Continuity, Insulation Resistance and Polarity.



Note 1: On a multi-way mains extension lead, make sure that you check all the socket outlets.

Note 2: The Insulation Resistance test is carried out at 360V. This means that surge-protected mains extensions will pass when this test is carried out on the BattPAT.

Note 3: The BattPAT is designed to pass leads with lengths up to 10 meters. When testing longer leads up to 25 meters press the long lead button once and the Long Lead light will come on. This will adjust the test limit for a 25 meter lead. The test can now be carried out by pressing the Power Lead button.

When testing longer leads up to 40 meters press the long lead button twice and the Long Lead light will start to flash. This will adjust the test limit for a 40 meter lead. The test can now be carried out by pressing the Power Lead button.

Once the testing is complete, it is important to label the leads.

Testing 110 V appliances

This requires a 110 V adaptor. This adaptor allows appliances with 110 V plugs to be tested. Just plug the adaptor into the BattPAT and connect the appliance to be tested into the yellow 110 V socket. Then use the BattPAT as normal.

Testing 3-phase appliances

This requires a 3-phase adaptor (Various models available). This adaptor allows appliances with 3-phase plugs to be tested. Just plug the adaptor into the BattPAT and connect the appliance to be tested into the 3-phase socket. Then use the BattPAT as normal.

These adaptors are designed to be used only with the BattPAT for testing purposes; under no circumstances are they to be connected to a mains outlet.

SPECIFICATION

EARTH CONTINUITY TEST

CURRENT	150 mA
OC VOLTAGE	9 V
TOLERANCE	5% + 20 mΩ
FAIL THRESHOLD (Normal Lead up to 10m)	> 250 mΩ
FAIL THRESHOLD (Long Lead up to 25m)	> 500 mΩ
FAIL THRESHOLD (Long Lead up to 40m)	> 800 mΩ

INSULATION TEST

TEST VOLTAGE	350 V
SC CURRENT	< 3 mA
TOLERANCE	5% + 0.1
FAIL THRESHOLD CLASS I	< 2 MΩ
FAIL THRESHOLD CLASS II	< 4 MΩ

POLARITY TEST

TEST VOLTAGE	5 V
SC CURRENT	0.5 mA
WORKING LOAD	>30 kΩ

BATTERY & CHARGING

BATTERY	9 V, NiMH
LIFE	500 operations
FAST CHARGE	100 mA, 1Hr
TRICKLE CHARGE	5 mA
CHARGER	DC 9-12V, 300-500mA

DIMENSIONS

HEIGHT	45 mm
WIDTH	285 mm
DEPTH	130 mm
WEIGHT	1.1 Kg

APPENDIX I
Suggested Frequency of Inspection & Testing of Equipment

SCHOOLS

	Class I		Class II	
Type	**Inspection**	**Insp. & test**	**Inspection**	**Insp. & test**
Stationary	12 months	12 months	12 months	48 months
IT	12 months	12 months	12 months	48 months
Movable	4 months	12 months	4 months	48 months
Portable	4 months	12 months	4 months	48 months
Hand-held	4 months	12 months	4 months	48 months

EQUIPMENT USED BY THE PUBLIC

	Class I		Class II	
Type	**Inspection**	**Insp. & test**	**Inspection**	**Insp. & test**
Stationary	monthly	12 months	3 months	12 months
IT	monthly	12 months	3 months	12 months
Movable	weekly	6 months	1 month	12 months
Portable	weekly	6 months	1 month	12 months
Hand-held	weekly	6 months	1 month	12 months

FACTORIES, COMMERCIAL KITCHENS

	Class I		Class II	
Type	**Inspection**	**Insp. & test**	**Inspection**	**Insp. & test**
Stationary	12 months	12 months	12 months	12 months
IT	12 months	12 months	12 months	12 months
Movable	1 month	12 months	3 months	12 months
Portable	1 month	6 months	3 months	6 months
Hand-held	1 month	6 months	3 months	6 months

CONSTRUCTION SITES

	Class I		Class II	
Type	**Inspection**	**Insp. & test**	**Inspection**	**Insp. & test**
Stationary	1 month	3 months	1 month	3 months
IT	1 month	3 months	1 month	3 months
Movable	1 month	3 months	1 month	3 months
Portable	1 month	3 months	1 month	3 months
Hand-held	1 month	3 months	1 month	3 months

Source: The Institute of Electrical Engineers; Code of Practice for In-service Inspection and Testing of Electrical Equipment.

Note: The above are suggested initial periods. If during inspection and testing items are always passing, then it is acceptable to reduce the frequency of testing. Conversely, if many items are found to fail, then it is important to test more frequently till any particular problems are identified and corrected.

CARING FOR YOUR BATTPAT

Annual calibration

Your BattPAT tester is an accurate instrument and it is important to make sure that it is continuing to measure correctly. A faulty tester could fail to pick up any faults with electrical appliances and result in passing them. To prevent this and ensure the accuracy of your BattPAT, we recommend that calibration is carried out annually. We will send you an annual reminder by e-mail or letter.

When you return the BattPAT to us we check it out thoroughly and:

Calibrate it with traceability back to National Standards.
Refurbish the unit and upgrade it if required.
Carry out a PAT test on the tester.
Issue a Calibration Certificate.

Collection & Delivery Service

We can arrange for the BattPAT to be collected for calibration and delivered back to you within 5 working days. All you have to do is to send us a completed order form.

Extended Warranty

When the BattPAT is calibrated we have introduced an option to extend the warranty for 12 months from the date of calibration for a small additional cost. Should the BattPAT fail for any reason during this period, please return it to us. We will repair it and ship it back to you free of charge. By doing this every year you can keep the BattPAT continuously in warranty for many years.

Booking a calibration

This couldn't be easier. You can request your calibration in a number of ways.

Download a booking form from our website www.firststopsafety.co.uk
Send us an e-mail to calibrations@firststopsafety.co.uk
Ring us on 01904 791050

Remember: All you have to do is to send us the order.
We will do everything else.

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